Message

**From:** Geoff Daly [geoffdaly@mkd-usa.com]
**Sent:** 9/29/2017 7:56:44 PM
**To:** Behl, Betsy [Behl.Betsy@epa.gov]
**CC:** 'Laurene Allen' Ex. 6 - Personal Privacy Charles Mower Ex. 6 - Personal Privacy
Catherine.corkery@sierraclub.org
**Subject:** RE: Nov 15th 2016 Clarification Memo on PFOA/PFOS drinking water HAs

Good morning *Betsy,*

Thank you for your response, which I thoroughly disagree with in the definition of "Lifetime Exposure" as promulgated within the EPA's web-site.

The EPA's web site definition is from an English Expression point of view when used in its context, as written on the Web-Site – bad use of such a definition's wording as it is not definitive as you describe below in your, response.

I have checked with various academic/professionals "English Language Writers" in the use of words to define a meaning/explanation such as the "Lifetime Exposure" as written on the EPA web-site for the PFOA/PFOS exposure. The time scale is based on the understanding; from the first time to one's death. Especially as the EPA/CDC web site documents refer to the Bio-Accumulation of these emerging contaminants – from your own website on HA's (To provide Americans, including the most sensitive populations, with a margin of protection from a *lifetime of exposure* to PFOA and PFOS from drinking water, EPA has established the health advisory levels at 70 parts per trillion - dated Aug 30th, 2017.

**Can a person drink tap water containing PFOA or PFOS at or below the level of the health advisory every day of their life and not expect adverse health effects from these chemicals?**

This health advisory level *offers a margin of protection* for all Americans from adverse health effects *for a lifetime of exposure to PFOA and PFOS in drinking water at this level. what ppt level in the water from day one is this calculated from? If below 70 ppt being supplied to homes etc., is still Bio-accumulative [like Lead]?*

Both PFOA and PFOS are persistent in the environment and in the human body. Over time both chemicals have become widely distributed in the environment and have *accumulated* in the blood of humans, wildlife, and fish. EPA's analysis indicates that exposure to these same levels will not result in adverse health effects (including cancer

and noncancer) to the general population over a lifetime (or any shorter period) of exposure to these chemicals. [at what input per day of drinking water containing less than 70 PPT]

**I could go on more and pull up the Original C8 report done on the DuPont Parkersburg plant contamination from PFOA/PFOS and other mixes of PFCs, the Hoosick Falls debacle, Bennington VT, Merrimack NH, Litchfield NH, Bedford NH, South Manchester NH, Amherst NH and now Nashua NH along with the various sites in NJ and lower PA.**

**All the time the "lifetime Exposure" is emphasized in these reports, even in the letter of Nov 15th, 2016 referencing your name as a source contact and refers in the 3rd and 4th line of the letter/memo** "These HAs, identify the concentration of PFOA and PFOS in drinking water at which adverse health effects are not anticipated to *occur over a lifetime*."

Health Effects - If humans or other animals ingest PFASs (by eating or drinking food or water than contain PFASs), the PFASs are readily absorbed, and can accumulate in the body. PFASs stay in the human body for long periods of time. As a result, as people get exposed to PFASs from different sources over time, the level of PFASs in their bodies may increase to the point where they suffer from adverse health effects.

Studies indicate that PFOA and PFOS can cause reproductive and developmental, liver and kidney, and immunological effects in laboratory animals. Both chemicals have caused tumors in animal studies. The most consistent findings from human epidemiology studies are increased cholesterol levels among exposed populations, with more limited findings related to:

- low infant birth weights,
- effects on the immune system,
- cancer (for PFOA), and
- thyroid hormone disruption (for PFOS

*Directly from the EPA web-site under [***Basic Information about Per- and Polyfluoroalkyl Substances (PFASs)** ***Includes Information on Perfluorooctanoic Acid (PFOA), Perfluorooctyl Sulfonate (PFOS), and All Other PFASs, and on PFCs]***

*Several NH Universities are also concerned along with the numerous NH members of the Union of Concerned Scientist, 350.0rg, Sierra Club together with several Attorney offices here in NH with the term "Lifetime Exposure" being so ill defined even with your below explanation.*

*Everyone disagrees with your EPA response and feel there is a need to revisit the terminology, as I originally suggested. So, the Public can clearly understand, when they read all the reams of information, reports, data on the EPA and NH DES web-sites.*

*This not a slight on what is going on with respect to the PFOA/PFOS and other emerging contaminants but the very poor presentation to the Public, who may not be engineers or Scientists and who may know all the terminology? [even people at NH DES have tried to explain some of the results, without any real success to the public. Even the Pease AFB command cannot come up with a real solid explanation at the recent CAPS meeting also attended by the ASTDR group of Doctors - "lifetime Exposure"]*

*NH has more than 188,000 water customers now exposed to varying levels of PFOA/PFOS and are worried for their short and long-term health in and around Nashua then add in the Pease AFB debacle and soon probably will include Rockingham County fire training center where levels exceed 11,000 PPT. They are spreading quickly into the Town of Brentwood's water Wells. Along with the Coakley Land fill near Portsmouth and Pease AFB and spreading out into the Ocean and Great Bay.*

*Please have your group revisit the terminology of "Lifetime Exposure"*

*Sincerely yours*

*Geoff*

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that you have received this message in error, please reply to the sender and delete this email promptly.

*Please consider the environment before printing this email*

**From:** Behl, Betsy [mailto:Behl.Betsy@epa.gov]
**Sent:** September 28, 2017 18:21
**To:** geoffdaly@mkd-usa.com
**Subject:** RE: Nov 15th 2016 Clarification Memo on PFOA/PFOS drinking water HAs

Dear Mr. Daly:

Thank you for your follow-up September 20th e-mail.

With regard to duration of exposure, the lifetime health advisory values (70 parts per trillion) apply to each day in a lifetime and not to a sum of all exposures across a lifetime.

With regard to sources of PFOA/PFOS exposure other than drinking water, we want to assure you that we made allowances for exposures, such as diet, air (including the droplets that are generated during showering), household dust, etc. In doing so, we set the health advisories at low enough levels to allow for 80% of an individual's total exposure to PFOA/PFOS to come from sources other than drinking water. (See Sections 6.1 and 6.2 of the Health Advisories for more information).

We developed the health advisories using the most protective scenario: the values are based on the water intake of a lactating mother because she supplies the food to her baby and has a proportionally higher water intake rate than any group, with the exception of formula fed infants. In this case, using a formula fed infant scenario was not justified based on the type of toxic effects observed in the studies.

We appreciate your interest in EPA's drinking water health advisories for PFOA/PFOS.

Sincerely,
Betsy Behl

**From:** Geoff Daly [mailto:geoffdaly@mkd-usa.com]
**Sent:** Wednesday, September 20, 2017 4:50 PM
**To:** Behl, Betsy <Behl.Betsy@epa.gov>
**Cc:** 'Laurene Allen' <Ex. 6 - Personal Privacy>; msullivan@seacoastassetmgt.com; 'FullerClark, Martha' <Martha.FullerClark@leg.state.nh.us>; Ex. 6 - Personal Privacy; abrown3@worcester.edu; Ex. 6 - Personal Privacy
**Subject:** RE: Nov 15th 2016 Clarification Memo on PFOA/PFOS drinking water HAs

Good afternoon *Betsy*,

Thank you for your response below. I understand the science behind the *absorption* and *adsorption* of *contaminants* into the Body, whether it is via *Oral ingestion via the mouth*, the *Respiratory* route via the nostrils or even the mouth and *Dermal* contact.

My question was around the PFOA/PFOS/PFC Health Advisory issued last May 2016 which reduced the, to *"Lifetime Exposure"* from 400 PPT to 100

PPT to 70 PPT. Please see below in my email emphasized in **RED**. As your response below is like a page from many of the EPA papers many of us have read over these past couple of years and they are for the average Lay-Person, very convoluted and written in a technical manner and not meant for the average Lay-Person trying to understand.

Especially when the word "Lifetime Exposure" and "Bio-accumulative" within various internal organs of the body [Thyroids, Kidneys, Liver, Testicles/Ovaries etc.] is mentioned and not clear!

The "Lifetime Exposure" needs to be clearly defined based on actual time(s) of exposure/ingestion "beginning" (even in "utero" if the mother is contaminated and so forth). As I stated below: **"due to the Bio-accumulation based on drinking water – say an 8-oz. glass with 10 ppt of PFOA/PFOS and maybe other chemicals mentioned above. The person may discharge through urination and feces 8 ppt of the 10 ppt; still leaves 2 ppt. then the next glass consumed delivers the same 10 ppt and same proportion % is discharged [maybe] and we are left with between 3-4 ppt and so on and so on for each ingestion of Water."** This does not include showers, hot baths or foods cooked in for example [the] 10 PPT PFOA/PFOS water supply, which you indicate below is not taken, into account in the studies and using only the Oral route! [why this is? When other health studies take, into account *TOTAL exposure of the body* such as Mercury exposures, PCB's, Methane emissions, the Corexit series of dispersants and numerous others]

So, the "Life-Time Exposure" needs to be clearly defined so the general, public have a clear and succinct understanding of the meaning (they can always have a blood test to see if they are exposed and have a known level in their Blood Stream and their water source is contaminated with a certain value of PFOA/PFOS) of "Life-time Exposure". It is my understanding that the CDC is looking, into the Aerosolized vapors from Showers/Hot baths and how they affect the ingestion values seen together with the cooking effects on various cellulosic foods. This is also important for the Public to be aware of and again is not really spoken about in the Health Advisory on PFOA/PFOS back in May 2016.

Please reconsider your first response as being part of the general scientific response to regular professionals, but not one clearly understood by the general-public, especially those with young children recently exposed to these emerging chemicals *without their knowledge [some now experiencing developmental and health problems; already identified by the C8 report]*. Clarity for these emerging contaminants is very important for the Public to be engaged with.

Sincerely yours,

*Geoff*

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**From:** Behl, Betsy [mailto:Behl.Betsy@epa.gov]
**Sent:** September 19, 2017 15:52
**To:** geoffdaly@mkd-usa.com
**Subject:** Nov 15th 2016 Clarification Memo on PFOA/PFOS drinking water HAs

Mr. Daly,

Thank you for your questions and concerns regarding EPA's health advisories (HAs) for PFOA and PFOS. In general, HAs identify the concentration of a contaminant in drinking water at which adverse health effects are not anticipated to occur over specific exposure durations (e.g., 1 day, 10 days, a lifetime). EPAs lifetime HAs for PFOA and PFOS present a guideline concentration in drinking water at which adverse health effects are not anticipated to occur over a human lifetime. This lifetime HAs are based on the latest health effects information for noncancer and cancer effects for PFOA and PFOS as described in EPA's Health Effects Support Documents for these chemicals (USEPA 2016a, b). The HAs for PFOA and PFOS were derived using a pharmacokinetic model that correlated the serum concentrations associated with effects in the animal studies to a human equivalent dose taking the differences in bioaccumulation and half-lives into consideration. Section 2 of the HA provides information on why the chemicals bind to proteins and have long half-lives. Uncertainty factors were applied to the human equivalent dose to account for intrahuman sensitivity differences (variability), physiological differences between humans and the experimental animals plus study duration compared to a human lifetime. The HA does not refer to a maximum concentration in blood serum, but is instead the maximum daily concentration **[Where are these numbers?]** that can be consumed *over a lifetime* in water that is used for drinking, showering, bathing, preparing food and other potable water uses.

Exposure to PFOA/PFOS from contaminated drinking water sources can occur via oral exposure (drinking water, cooking with water, and incidental ingestion from showering); dermal exposure (contact of

exposed parts of the body with water containing PFOA during bathing or showering, dishwashing); and inhalation exposure (during bathing or showering or using a humidifier or vaporizer). There is limited information identifying health effects from inhalation or dermal exposures to PFOA in humans and animals. Therefore, these routes of exposure are not quantitatively used in the derivation of the HA other than through attributing 20 percent of the total water to the drinking water consumed with beverages prepared using the drinking water. The remaining 80 percent is attributed to other sources (e.g., diet and dust). PFOA has a low vapor pressure and is not expected to be present in air except as bound to particulate matter and in aerosols formed from devices such as shower heads and humidifiers that aerosolize tap water. Most of the toxicity data come from studies that used the oral exposure route, not the other exposure routes (inhalation and dermal exposures). PFOA and PFOS are not removed by heating water and can increase in concentration when the water is boiled.

Findings from studies on populations in the United States, Canada, and Western Europe support the conclusion that diet is the major contributor to total PFOA and PFOS exposure with drinking water and/or dust as important additional oral exposure routes, especially for sensitive subpopulations. It has been detected in a variety of foods including snack foods, vegetables, meat, dairy products, human breast milk, and fish. Occurrence in food products can result from the use of contaminated water in processing and preparation; growth of food in contaminated soils; direct and indirect exposures of domestic animals to PFOA and PFOS from drinking water, consumption of plants grown in contaminated soil, and through particulate matter in air; fish from contaminated water ways; and packaging materials. Because EPA has determined that non-drinking water sources such as food and dust account for a higher percentage of total exposure, the HAs were calculated using a conservative approach to public health by applying an RSC factor of 20 percent to the RfD, and attributing the major portion (80 percent) of the total exposure to sources other than drinking water.

Between 2000 and 2002, PFOS was voluntarily phased out of production in the U.S. by its primary manufacturer, 3M. EPA also issued regulations to limit future manufacturing, including importation, of PFOS and its precursors. A limited set of existing uses for PFOS (fire resistant aviation hydraulic fluids, photography and film products, photomicrolithography process to produce semiconductors, metal finishing and plating baths, component of an etchant) was excluded from these regulations because these uses were ongoing and alternatives were not available.

In 2006, to help reduce exposure to PFOA nationwide, EPA asked eight major companies to commit to working toward the elimination of their production and use of PFOA, and chemicals that degrade to PFOA, from emissions and products by the end of 2015. All eight companies have indicated that they have phased out PFOA, and chemicals that degrade to PFOA, from emissions and products by the end of 2015. Additionally, PFOA is included in EPA's proposed Toxic Substance Control Act's Significant New Use Rule (SNUR) issued in January 2015 which will ensure that EPA has an opportunity to review any efforts to reintroduce the chemical into the marketplace and take action, as necessary, to address potential concerns.

In January 2016, the Food and Drug Administration amended its regulations to no longer allow PFOA and PFOS to be added in food packaging, which will likely decrease one source of non-drinking water exposure.

The most recent data from the CDC (2017) National Health and Nutrition Examination Survey demonstrate that the PFOA and PFOA serum levels have decreased since they were first monitored in 1999 to 2000.

Thank you for your interest in the health advisories for PFOA and PFOS.

Betsy

Elizabeth (Betsy) Behl, Director
Health and Ecological Criteria Division, 4304-T
Office of Science and Technology, Office of Water

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**References:**

CDC, 2017, Fourth national report on human exposure to environmental chemicals, Updated Tables volume 1 p 350-357

USEPA (U.S. Environmental Protection Agency). 2016a. Health Effects Support Document for Perfluorooctanoic Acid (PFOA). EPA 822R16003. U.S. Environmental Protection Agency, Washington, DC. Accessed May 2016. https://www.epa.gov/safewater.

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**From:** Geoff Daly [mailto:geoffdaly@mkd-usa.com]
**Sent:** Thursday, August 24, 2017 5:39 PM
**To:** Behl, Betsy <Behl.Betsy@epa.gov>
**Cc:** 'Thurman, Kari (Shaheen)' <Kari_Thurman@shaheen.senate.gov>; Ann McLane Kuster <NH02AMIMA@mail.house.gov>
**Subject:** Nov 15th 2016 Clarification Memo on PFOA/PFOS drinking water HAs

Good morning *Beth*,

I have just re-read the main HA from May 2016 and the Memo of Nov 2016 on PFOA/PFOS.

Here in NH there is some concerns with reference to the use of contaminated waters with PFOA/PFOS from the Saint Gobain Plant in Merrimack NH and surrounding towns of Litchfield, Bedford, Manchester and Amherst and now Nashua main water supplies now compromised for nearly 80,000 people and many are still on BOTTLED water for drinking.

When the waters are not used for DRINKING Purposes, but for Cooking and Showering (especially when hot and steamy), the concerns are as follows: -

- Certain vegetables have a *cellulosic structure* which are *micro-porous* and any PFOA/PFOA and *even other known chemicals and Pharmaceuticals [known to be in the waters].* Which cannot be removed as the technology to do so is not used, for some reason? During cooking, they can bind to these cellulosic structures and be ingested. **Because many of the PFOA/PFOS are bio-accumulative, they will build up over time, along with any of the waters drunk. Thus, the LIFETIME Exposure would be *shortened or aggravated in younger children whose bodies are still developing*! This section of the HAs should be revisited immediately and verified for all *cooked foods involving "Water Use".* The lifetime exposure of *70 PPT* can and will be reached before someone dies or is diagnosed with a Health Problem, due to the Bio-accumulation based on drinking water – say an 8-oz. glass with 10 ppt of PFOA/PFOS and maybe other chemicals mentioned above. The person may discharge through urination and feces 8 ppt of the 10 ppt; still leaves 2 ppt. then the next glass consumed delivers the same 10 ppt and same proportion % is discharged [maybe] and we are left with between 3-4 ppt and so on and son each ingestion of Water. Won't take long to reach the LIFETIME EXPOSURE as per the EPA's advisory.**

- **Peer reviewed DATA has already shown which organs bio-accumulate these PFOA/PFOS**, admittedly each person reacts differently and we all know the US population is already contaminated with PFC based chemicals. The NJ Water Board Authority report addresses the potential Health problems and crises in that state and labor health effects on the State's economy and Families jobs. This must be addresses Nationwide.

- **Now we come to using PFOA/PFOS contaminated water for showering. All shower heads tend to AERSOLIZE the spray and can be breathed in to the lungs, less than 3-5 µ. This IS accelerated when a Hot Steamy SHOWER is taken - even faster ingestion. Due, to the fact that the PFOA/PFOS molecules do not flash off like some chemicals, but remain stable and are in the Sub µ range below 3 µ down to the Angstrom range of 5 to 100 Angstroms.**

Maybe the EPA HAs for these chemicals **needs to be revisited for the *ingestion via cooking and showering*** (maybe even taking ***a hot steamy bath***?). **The HAs are rather nebulous and non-conclusive in any of the major reports on the PFOA/PFOS ingestion/contacts. Some obfuscation is present in the reports and finding after more than 12 years of study.**

I look forward to your offices response and future clarifications to be put out ASAP. I know there are ongoing studies, which in today's Mass Spectrometry and Electron-Microscopic, is taking far too long. Added to this, is that the TOSCA list should *allow only products to be introduced* onto the market after a *full 3 phase clinical analysis, just like* PHARMACEUTICAL companies under go.
Then we probably would not have 70,000 plus chemicals listed with many just slight variations occurring when a problem arises [e.g. **the PFC range has gone from a C8 formulation to a C6, which turns out is more toxic!]**

Sincerely yours

*Geoff*

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